Department of Pacific Affairs
Building on 20 years of the State, Society & Governance in Melanesia Program

Disaster Risk Reduction in Papua New Guinea

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At 3:45 am on 26 February 2018, a magnitude 7.5 earthquake occurred in Papua New Guinea with an epicentre 30 kilometres south-west of Tari. Over 140 people are known to have died and roads, airfields, schools and health facilities in three provinces were badly damaged. Gas and oil processing plants were also damaged, large mines put out of action and the national economy threatened. Numerous landslides occurred, some of which dammed rivers and buried villages, roads and gardens.

This In Brief considers whether anything could have been done beforehand to reduce the impact of this event, and whether anything can be done now to reduce the impact of future events. If nothing can be done, it will mean that every few years Australia must fund expensive relief operations by the Australian Defence Force (ADF), non-government organisations and PNG agencies from the Department of Foreign Affairs and Trade's (DFAT) humanitarian budget. Between 1918 and 2006 there were 68 humanitarian operations by the ADF, half of which were conducted in PNG (Bullard 2017). The Australian public, and the rest of the world, expect Australia to help its Pacific neighbours in their times of need.

Cause and prediction

Social media posts and newspaper reports suggest that people were surprised by the earthquake and angrily demanded explanations for its occurrence and the many aftershocks. Political corruption, LNG gas extraction and God's punishment of the sinful have been suggested as possible causes. It seems no one in Hela and Southern Highlands provinces was prepared for an earthquake of this magnitude, including the petroleum companies based there.

The earthquake was, in fact, a result of PNG's location on top of a tectonic subduction zone, where the Australian continental plate is forced under the Pacific Plate at an average rate of about 100 millimetres per year. The collision of the continental plates buckles and fractures the earth's crust and created PNG's central mountain range and highlands valleys, where many people now live. Along the southern edge of the highlands is the Papuan Thrust Zone, running through Western, Hela, Southern Highlands and Gulf provinces. Along the thrust zone, the crust remains locked for many years and then suddenly gives way and moves violently.

Records show that a similar magnitude earthquake occurred in the same area in 1922 and a slightly smaller one in 1954. Older people at Hides remember the 1954 earthquake and can point out where landslides occurred. A paper published in 1983 estimated a 100-year return period for a magnitude 7.7 earthquake along the Papuan Thrust Zone and compared this area with California (Ripper and McCue 1983). This research is being revised using an additional 40 years of data, but the predictions have not changed significantly. A large earthquake is expected to happen in California one day; why was one not anticipated in Hela province?

Disaster Risk Reduction

Disaster Risk Reduction (DRR) is undertaken before an event occurs. In contrast, responses to a disaster take place after the event. The third United Nations World Conference on Disaster Risk Reduction took place at Sendai, Japan, in 2015. The Sendai Framework aims to reduce mortality from natural hazard events, the number of people impacted by natural hazards, economic losses, and the damage to infrastructure and the interruption of critical services. Clearly, no effective DRR has been undertaken in Hela and Southern Highlands.

Australia endorsed the Sendai Framework in 2015. The Australian aid program is said to be promoting and supporting countries in the Indo-Pacific to understand disaster risk, strengthen disaster risk governance, invest in disaster risk reduction and enhance disaster preparedness for effective response (DFAT 2018). With one exception, Australia did not develop its own DRR programs in PNG. Instead, it funds programs initiated by the UN Office for Disaster Risk Reduction (UNISDR), the European Union's Global Facility for Disaster Reduction and Recovery (GFDRR) and the closely associated Global Program for Safer Schools (GPSS), the UNDP's

Pacific Risk Resilience Programme (PRRP), the OECD's Resilience Measurement program and ActionAid South Asia Women's Resilience Index. Apart from running workshops and roundtables in main centres, these organisations have not worked on specific hazards at the district, ward or village level in PNG.

The exception is the Papua New Guinea/Australia Volcanological Service Support (VSS) Project at the Rabaul Volcanological Observatory (RVO), and the subsequent twinning program with RVO and Geoscience Australia (GA). These programs re-equipped the RVO, set up monitoring of five high risk volcanoes, enhanced knowledge of PNG volcanology and improved logistics. A Volcano Hazard Information Management program was initiated that identified risk to communities around the five selected volcanoes, provided those communities knowledge of the risk and enhanced their preparedness for an eruption (GA 2007). This is excellent DRR but falls far short of what is required in the rest of PNG. When the Kadovar volcano, not one of the five selected, erupted on 5 January 2018, the first the RVO knew of it was from Facebook posts. It is extremely fortunate the Kadovar cone did not collapse into the sea or that seawater did not come into contact with new magma. About 700 people on Kadovar, with help from neighbours, evacuated themselves.

Recommendations

PNG needs a proper Disaster Risk Reduction program alongside the existing disaster response programs. Such a program would have similar goals to the Sendai Framework but focus on education and resilience. Risks must be identified based on geology, climatology and engineering, as well as on oral history, history, agriculture, food production and population distribution. An education program tailored to the specific identified risks could be extended to communities at risk. Safe havens could be identified and communities informed of them, which now only occurs around the volcanoes identified by the RVO. Such a program could be offered through schools by trained school teachers, supported by district staff and backed by a national DRR program. Utilising schools would result in the information being provided regularly to almost all communities, rather than via much less effective one-off visits to easily accessible places.

Geoscience Australia could lead a collaborative program with experts in Australia and PNG. GA has good relations with the RVO and the PNG Geophysical Observatory and has begun updating the earthquake hazard map of PNG. Additionally and importantly, engineering and building codes should be reviewed and enforced. PNG has numerous poorly constructed buildings and roads (Wari 2018) due to a lack of inspections and corrupt tendering processes.

Such a program would be a long-term investment by Australia, not only to reduce risk in PNG but to reduce the costs of recovery to Australia taxpayers. As a nearest neighbour and first response country, Australia need not wait for PNG to request the development of a DRR program. It can legitimately approach the Government of PNG and suggest collaborative planning begin immediately by Australian and Papua New Guinean experts.

Author notes and acknowledgements

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